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XXIV. *Observations tending to shew that the Wolf, Jackal, and Dog, are all of the same Species.* By John Hunter, Esq.  
F. R. S.

Read April 26, 1787.

THE true distinction between different species of animals must ultimately, as appears to me, be gathered from their incapacity of propagating with each other an offspring capable again of continuing itself by subsequent propagations: thus the Horse and Ass beget a Mule capable of copulation, but incapable of begetting or producing offspring. If it be true, that the mule has been known to breed, which must be allowed to be an extraordinary fact, it will by no means be sufficient to determine the Horse and Ass to be of the same species; indeed, from the copulation of Mules being very frequent, and the circumstance of their breeding very rare, I should rather attribute it to a degree of monstrosity in the organs of the Mule which conceived, not being those of a mixed animal, but those of the Mare or female Ass. This is not so far-fetched an idea, when we consider that some true species produce monsters, which are a mixture of both sexes, and that many animals of distinct sex are incapable of breeding at all.

If then we find nature in its greatest perfection deviating from general principles, why may not it happen likewise in the production of Mules, so that sometimes a Mule shall breed from the circumstance of its being a monster respecting mules?

The times of uterine gestation being the same in all the varieties of every species of animals, this circumstance becomes necessary to determine a species.

The affinity between the Fox, Wolf, Jackal, and several varieties of the Dog, in their external form and several of their properties, is so striking, that they appear to be only varieties of the same species. The Fox would seem to be a greater remove from the Dog than either the Jackal or Wolf, at least in disposition, not being either so sociable respecting its own species or man, but naturally a solitary animal; from all which I should suspect it is only allied to the Dog by being of the same genus. It is confidently asserted by many, that the Fox breeds with the Dog, but this has not been accurately ascertained; but, if it had, it would probably have been carried further, and once breeding, according to what we have said, does not constitute a species; this, however, is a part I mean to investigate. Wolves and Jackals are found in herds; and the Jackal is so little afraid of the human species, that, like a Dog, it comes into houses in search of food, more like a variety of the Dog in consequence of cultivation than chance. It is by much the most familiar of the two; for we shall find hereafter, that in its readiness to copulate with the Dog, and its familiarity with the Dog afterwards, it is somewhat different from the Wolf. The Wolf then being an animal better known in Europe, where inquiries of this kind are made, some pains has been taken to ascertain, whether or not it was of the same species with the dog; but, I believe, it has been hitherto considered as only belonging to the same genus.

Accident often does as much for natural history as premeditated plans, especially when nature is left to itself. The first instance of the Dog and Wolf breeding in this country seems

seems to have been about the year 1766. A Pomeranian Bitch of Mr. BROOKES's, in the New Road, was lined only once by a Wolf, and brought forth a litter of nine healthy puppies. The veracity of Mr. BROOKES is not to be doubted, respecting the Bitch being lined by a Wolf; yet, as it was possible she might have been lined by some common Dog without his knowledge, the fact was not clearly made out; but it has been since ascertained, that the Dog and Wolf will breed. Several noblemen and gentlemen bought some of the puppies, as I was informed by Mr. BROOKES. My Lord CLANBRASSIL purchased a Bitch-puppy; and Mr. BROOKES presented one to me, which I kept for observations and experiment. Its actions were not truly those of a Dog; it had more quickness in attending to things, was more easily startled, as if particularly apprehensive of danger, quicker in transitions from one action to another, not so ready to the call, being less docile; and from these peculiarities it lost its life, being stoned to death in the streets for a mad dog.

Hearing that Lord CLANBRASSIL's Bitch had bred, Sir JOSEPH BANKS was so obliging as, at my request, to write to his Lordship, who sent the following account.

S I R,

About seventeen or eighteen years ago, the late Lord MONTHERMER and I happened to see a Dog-wolf at Mr. BROOKES's, who deals in animals, and lives in the New Road. The animal was remarkably tame; and it struck us, for that reason, that a breed might be procured between him and a Bitch.

We promised Mr. BROOKES a good price for puppies, if he succeeded. In about a year a Bitch produced nine, and Lord

MONTHERMER bought one; and I had another, which was a Bitch. Lord MONTHERMER's died of fits in about two years: mine lived longer, and had puppies only once. One I gave to Lord PEMBROKE; but what became of it I do not remember. It was grand-daughter of the Wolf by the dam, and got by a large Pointer of mine.

It might be considered, that Mr. BROOKES's word was not sufficient proof that the puppies were really got by the Wolf; but the appearance of the animals, so totally different from all others of the canine species, did not leave a doubt upon our minds; and I remember HANS STANLEY, who had adopted BUFFON's opinion, was thoroughly convinced upon seeing mine. The animals had the shape of the Wolf refined: the fur long, but almost as fine as that of the black Fox.

I am afraid I have trespassed too much upon your time, and will only beg you will be assured nothing can give me more pleasure than any opportunity of assuring you how truly

I am, Sir, &c.

CLANBRASSIL.

Jan. 7, 1787.

Upon the supposition that Mr. BROOKES's Bitch was lined by no Dog but the Wolf, which I think we have no reason to doubt, the species of the Wolf is ascertained; but I chose to trace this breed still further; and hearing that Lord PEMBROKE's Bitch had likewise bred, I was anxious to know the truth of it; and, finding his lordship was in France, I took the liberty of writing to Lord HERBERT, and received in answer the following letter.

S I R,

Wilton-house, Dec. 20, 1786.

The half-bred Wolf-bitch you allude to was given, as I have always understood, to Lord PEMBROKE by Lord CLANBRASSIL. She might, perhaps, have been bought at BROOKES's by him. She had four litters, one of ten puppies, by a Dog between a Mastiff and a Bull-dog. One of these was given to Dr. EYRE, at Wells in Somersetshire, and one to Mr. BUCKETT, at Stockbridge. The second litter was of nine puppies, some of which were sent to Ireland, but to whom I know not. This litter was by a different Dog, but of the same breed as the first. The third litter was of eight puppies, by a large Mastiff. Two of these were, I believe, sent to the present Duke of QUEENSBERRY. The fourth litter consisted of seven puppies; two of which were sent to M. CERJAT, a gentleman who now resides at Lausanne in Switzerland, and is famous for breaking dogs remarkably well. These two puppies were, however, naturally so wild and unruly, that he found it impossible to break them. She died four years ago, and the following inscription was put over the place where she is buried in this garden, by Lord PEMBROKE's orders.

Here lies Lupa,  
whose grand-mother was a Wolf,  
whose father and grand-father were Dogs, and whose  
mother was half Wolf and half Dog. She died  
on the 16th of October, 1782, aged 12 years.

I am sorry it is not in my power to give you any better account; but if you think proper to write to Lord PEMBROKE,

who is at Paris, I am convinced he will be very happy to give you any further information.

I am, &c.

HERBERT.

BUFFON, whose remarks in natural history are well known, made experiments to ascertain how far the Wolf and Dog were of the same species, but without success. He says, "A She-wolf, which I kept three years, although shut up very young, and along with a Greyhound of the same age, in a spacious yard, could not be brought to agree with it, nor endure it, even when she was in heat. She was the weakest, yet the most mischievous; provoking, attacking, and biting the Dog, which at first only defended itself, but at last killed her." And in another part of his work, he makes the following observation: "The Dog, the Wolf, the Fox, and the Jackal, form a genus, of which the different species are really so nearly allied to each other, and of which the individuals resemble each other so much, particularly by the internal structure and parts of generation, that it is difficult to conceive why they do not breed together\*."

This

\* In the Supplement to his Works, he gives the following account which had been sent to him. "A very young She-wolf, brought up at the Marquis of SPONTIN's, at Namur, had a Dog, of nearly the same age, kept with it as a companion. For two years they were at liberty, coming and going about the apartments, the kitchen, the stables, &c. lying under the table, and upon the feet of those who sat round it. They lived in the greatest familiarity.

"The Dog was a strong Greyhound. The wolf was fed on milk for six months; after that, raw meat was given her, which she preferred to that which was  
"dressed,

This part of natural history lay dormant till Mr. GOUGH, who sells birds and has a collection of animals on Holborn Hill, repeated the experiment on a Wolf-Bitch, which was very tame, and had all the actions of a Dog under confinement. A Dog is the most proper subject for comparison, as we have opportunities of being acquainted with its dispositions and modes of expressing its sensations, which are most distinguishable in the motion of the ears and tail; such as pricking up the ears when anxious, wishing, or in expectation; depressing them when supplicant, or in fear; raising the tail in anger or love, depressing it in fear, and moving it laterally in friendship; and likewise in raising the hair on the back from many affections of the mind. This animal became in heat in the month of December 1785; and as Mr. GOUGH had some idea of breeding from wild animals, as Monkies, Leopards, &c. he was anxious to have the Wolf lined by some Dog; but she

“dressed. When she ate no one durst approach her; but at other times people  
“might do as they pleased, provided they did not use her ill. At first she made  
“much of all the Dogs which were brought to her; but afterward she gave the  
“preference to her old companion, and from that time she became very fierce  
“if any strange Dog approached her. She was lined for the first time on the  
“25th of March; this was frequently repeated while her heat continued, which  
“was sixteen days; and she littered the 6th of June, at eight o’clock in the  
“morning; the period of gestation was therefore seventy three days at the  
“most\*. She brought forth four young ones of a blackish colour, some of  
“whose feet, and a part of the breast, were white; in this respect taking after  
“the Dog, who was black and white. From the time she littered she became  
“furlly, and set up her back at those who came near her; did not know her  
“masters, and would even have killed the Dog, if it had been in her power.”

\* This is a longer period than in the Bitch by at least ten days; but as the account was made from the first time of her being lined, and she was in heat for a fortnight, and lined in that time, it is very probable, if the time was known when she conceived, that it would prove to be the same period as in the Dog.



would not allow any Dog to come near her, probably from her not being accustomed to be with Dogs, and being always chained. She was held, however, while a greyhound Dog lined her, and they were fastened together exactly as the Dog and Bitch. While in conjunction she was pretty quiet; but when at liberty, she endeavoured to fly at the Dog. In this way she was twice lined. She conceived, and brought forth four young ones. The time she went with young was not exactly known; but it was believed to be the same as in the Bitch. Two of the puppies were like the Dog in colour, who had large black spots on a white ground; one was of a black colour, and the fourth of a kind of dun, and would probably have been like the mother. She took great care of them, yet did not seem very anxious when one was taken from her by the keeper; nor did she seem afraid when strangers came into the room. Unfortunately these experiments were carried no further; one being sold to a gentleman, who carried it to the East-Indies; and the other three were killed by a Leopard, one of which I was to have had. The same Wolf was in heat in December 1786, and was lined several times by a Dog. She pupped on the 24th of February 1787, and had six puppies, which may afford opportunities, if they are thought necessary, of repeating experiments on this subject.

While pursuing this subject, I was informed, that Captain MEARS, of the Royal Bishop East-India-man, had brought home a bitch Jackal with young, which had brought forth soon after his arrival; and that he had given the bitch Jackal and one puppy to Mr. BAILEY, Bird-merchant, in Piccadilly. I went to see them, and purchased the puppy, the subject of the following experiment, which had dispositions very similar

to

to the half-bred Wolf which I had from Mr. BROOKES before mentioned.

To have a true history of this animal, I took the liberty of writing to Mr. MEARS, who politely called upon me, and, at my request, put down the particulars in the form of a letter to me, of which the following is a copy.

S I R,

I had the honour of yours the 15th instant; and with regard to the female Jackal, I can assure you, that she took a small spaniel Dog of mine on board my ship, the Royal Bishop. I had her, when a cub, at Bombay; and a very short time before I arrived in England she got to heat, and enticed this small dog into the long-boat, where I saw them repeatedly fast together. I brought her to my house in the country, where she pupped six puppies, one of which you have seen. Mr. PLAW, at N° 90, Tottenham-Court-Road, has a Dog-puppy, which will be at your service at any time you chuse to send for him, to make any further experiments: I called on Mr. PLAW, and got his promise to let you have the Dog.

I have the honour to be, Sir, &c.

WM. MEARS.

N° 107, Hatton-street,  
16th Jan. 1786.

P. S. I had the Bitch on board fourteen months.

I took this puppy into the country, and chained it up near a mastiff Dog, and they were very familiar, and seemingly fond of each other. When the Bitch became first in heat, I could not get a proper Dog for her; but the latter end of September being again in the same situation, several Dogs were procured, and left with her. They appeared indifferent about her; probably from being in a strange place; and she did not seem inclined to be familiar with them; whether the great Dog might be able to line her I do not know; she was, however, twice tied by a Tarrier on the 3d of October. In a few weeks she was evidently become bigger; and on the 30th of November, in all fifty-nine days, she brought forth five puppies. Some days before this period she dug a hole under ground, by the side of her kennel, in which she brought forth, and it was some time before she would allow the puppies to stay in the kennel when put there. In about eight days some, and nine days others of them began to open their eyelids.

Here then is an absolute proof of the Jackal being a Dog; and it appears to me, that the Wolf is equally made out to be of the same species. It now then becomes a question, whether the Wolf is from the Jackal, or the Jackal from the Wolf, supposing they had but one origin? From the supposition, that varieties become more tame in their nature, we should be led to believe, the Wolf to be the original, and that the Jackal was a step towards civilisation in that species of animal. There are Wolves of various kinds, each country having a Wolf peculiar to itself; but the Jackals that I have seen have been more uniformly the same, both those from Africa, and those from the East-Indies. I am informed, however, that they vary in size. Whether all the Wolves of different countries are of one species, or some of them only of the same

same genus, I do not know; but I should rather suppose them to be all of one species. What is with me an argument in favour of this supposition is, that, if there were Wolves of distinct species, we should have had by this time a great variety of that species of Wolves, with the various dispositions arising from variation in other respects; and those varieties now turned to very useful purposes, as has been the case with the Dog; for all the Wolves we are yet acquainted with, have naturally the principle of cultivation in them, as much probably as any animal, or as much at least as those Wolves we now know to be Dogs. The not having a civilised species of Wolf is, indeed, with me a proof that they are all of the same species with the Dog. If they are all of the same species with the Dog, then the first variety that took place was still in the character of a Wolf, differing only in colour, or some trivial circumstance, which could only take place from a difference in climate; civilisation or cultivation in a state of nature being the same in them all. Where they became Jackal, or what we now call Dog, is difficult to say; or what Dog we can call the first remove, as many Dogs differ very much from one another; or whether the Jackal is the intermediate link between the Wolf and the Dog. In either case we have three great varieties in this species, Wolf, Jackal, and Dog, with the varieties in each. If the Dog is proved to be the Wolf tamed, the Jackal may probably be the Dog returned to his wild state.

To ascertain the original animal of a species, it is proper to examine all the varieties of that species, and see how far they have the character of the genus, and what resemblance they bear to the other species of the genus; for it is natural to suppose, that the original, or the animal which is nearest to it,

will have more of the true character of the genus, and will have a stronger resemblance to the species nearest allied to it, than any of the other varieties of its own species.

If we apply this to the Dog, and consider the Fox as a distinct species, which there is great reason to believe it is, that variety which has the strongest resemblance to the Fox, is to be looked upon as the original of all the others; which will prove to be the Wolf.

Another mode of considering this subject, which is however secondary to the above, is, supposing that all animals were at first wild; and, therefore, that those animals which remain wild, are the original stock; and that the further we find animals removed from their originals in appearance, they are really further removed in consequence of variation taking place from cultivation, so that we may still be able to trace the gradation. What gives some force to this idea is, that where the Dogs have been least cultivated, there they still retain most of their original character, or similarity to the Wolf or the Jackal, both in shape and disposition. Thus the shepherd's Dog, all over the world, has strongly the character of the Wolf or Jackal; so that but little difference is to be observed, except in size and hair. Size is, perhaps, a variety taking place under a variety of circumstances; but difference in hair is, in general, influenced by climate, although perhaps not always so. Thus the Wolf has longer and softer hair than the Jackal, because he is a more northern animal; and the Jackal and shepherd's Dog in Portugal and Spain have shorter and stronger hair than those of Germany or Kamchatka, from inhabiting warmer climates. But when we consider their general shape, the character of countenance, the quick manner with the pricked and erect ears, we must suppose them varieties  
of

of the same species. The smelling at the tail has been described as characteristic of the Dog; but, I believe, it is common to most animals, and only marks the male; for it is the most certain way the male has of knowing the female, and also discloses another scent, which is the final intention, whether the female is disposed to receive the male.

The Esquimaux Dog, and that found among the Indians as far south as the Cherokees; the shepherd's Dog in Germany, called Pomeranian; the shepherd's Dog in Portugal and Spain; have all a strong similarity to the Wolf and Jackal.

BUFFON, on the origin of Dogs, seems to have possessed nearly the same idea; for he says the shepherd's Dog is the original stock from which the different races of Dogs have sprung.

As the Wolf turns out to be a Dog, it seems astonishing, that there was no account of Dogs being found in America. But this I consider as a defect in the first history of that country, for there are Wolves; and I think, in spite of all that has been said to the contrary, the Esquimaux and Indian Dog is only a variety from a Wolf in that country, which had been tamed. Mr. CAMERON, of Titchfield-street, who was many years among the Cherokees, and considerably to the westward of that country, observes, that the Dog found there is very similar to the Wolf; and that the natives consider it to be a species of tame Wolf; but as we come more among the Europeans who have settled there, the Dogs are more of a mixed breed; for why they should only have had this kind of Dog transported among them, while every other part of America has the varieties of Europe, is not easily solved.

The voice of animals is commonly characteristic of the species; but I should suppose, it is only characteristic of the original species, and not always of the variety, and this

supposition

supposition holds good in the Dog species. It would appear, that the voice of the Wolf and the Jackal is very similar, and is principally conveyed through the nose, and exactly resembles that noise in Dogs, which is a mark of longing or melancholy, and also of fondness; but has no resemblance to the bark of the Dog, which they do not perform. Barking is peculiar to certain varieties of the Dog kind, and even some that do bark, do it less than others. The Dogs in the South-Sea islands do not bark: our Greyhound barks but little; while the Mastiff, and many of the smaller tribe, as Spaniels, are particularly noisy in this way. It would appear as if the frequency of this noise arose from imitation; for the Dogs in the South-Seas learn to bark; and others, as the Hound, have a peculiar howl, which, by huntsmen, is called the tongue. This noise, as also the bark, is made by opening the mouth. A variety in the voice, or some parts of the voice, in the varieties of the same species, is not peculiar to the Dog.

